

**TITLE:** ANALYSIS, QUALITY, AND CHARACTERISTICS OF LICORICE  
EXTRACT - NEW DEVELOPMENTS

**AUTHOR:** P. S. Vora\*

**AFFILIATION:** MacAndrews & Forbes Company, Third Street and Jefferson Avenue,  
Camden, NJ 08104

**ABSTRACT:** Licorice products derived from the root of *Glycyrrhiza glabra* have been in existence for many centuries and have been utilized extensively in tobacco, pharmaceuticals and food industries for many years. Traditionally, glycyrrhizin, which is a complex matrix of organic compounds including glycyrrhizic acid, has been used as a sole parameter to determine cost-performance ratio of licorice products. However, methods employed to determine glycyrrhizin are non-specific, time-consuming, have poor reproducibility, and yield artificially high values if licorice products are modified chemically or otherwise. A systematic analytical approach to determine the quality and characteristics of licorice products based on recent developments in liquid chromatography, enzymatic and elemental analyses has been developed. Glycyrrhizic acid (at two different wavelengths) and individual sugar components are determined by high-performance liquid chromatography and starch by enzymatic analysis. The concentration of various metals is determined by elemental analysis. Viscosity-temperature-concentration and surface active characteristics of licorice extract have been evaluated. The quality and cost-performance ratios--determined by the ratio of glycyrrhizin/glycyrrhizic acid, the ratio of sucrose/ reducing sugars, elemental analysis (ash) and an understanding of the characteristics of licorice extracts--are specific, accurate and independent of any chemical or other types of modification of licorice products.

**REVIEW:** Peter S. Vora of MacAndrews & Forbes Company (MAFCO) briefly reviewed the use of licorice extract in tobacco and other products and the classic analytical methods for determining glycyrrhizin, a component system of licorice. He stated that the classic methods are inadequate and described new analytical procedures developed by his company for more rapid, accurate determinations. The author also explained procedures for licorice root extraction and emphasized the various parameters used to control product consistency. The major components of licorice extract as determined by MAFCO are as follows: glycyrrhizin, sugars (cane, reducing), starch, gums, and inorganic salts.

-Reviewed by C. Kounnas

1000818193